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FIELD EXAMINATION REPORT

RAINIER DRAINAGE DISTRICT WATERSHED

COLUMBIA COUNTY

OREGON

APRIL 1955



C O N T E N T S

	Page
Introduction	1
Location	1
Ownership	2
Physiography	2
Geology and Soils	2
Climate	3
Vegetative Cover	3
Cooperation	4
Economy	5
Watershed Problems	5
Summary	7
Map	

RAINIER DRAINAGE DISTRICT WATERSHED

Field Examination Report

INTRODUCTION

This report has been prepared to supplement and complement the information made available in the application of the sponsoring groups. It is intended to furnish a background for determining watershed project feasibility and for approval or disapproval of the application by the State Engineer of Oregon and the State Conservationist of the Soil Conservation Service.

The supervisors of the Clatskanie Soil Conservation District were informed that a Watershed Protection and Flood Prevention Act, Public Law 566, was passed by the 83rd Congress, with features in it which might be of interest to the people of the watershed of the District. This information was brought before the people and the farmers of the Rainier Drainage District Watershed and they decided to prepare an application for assistance. The need for a correction of their drainage problems is very apparent. Also some flood protection is needed.

It seems their main problem is excess water from flood and regular flow sources contributed by small watershed streams and hill seepage. The people in the area are very much interested in eliminating these problems and have some money to contribute.

The two sponsors, the Clatskanie Soil Conservation District and the Rainier Drainage District, comprise the necessary organizational groups that would carry on any program which might be agreed upon. There are older supporting groups such as the City of Rainier and local fraternal organizations.

The following organizations assisted in the field examination: The State Game Commission, State Fish Commission, the U. S. Forest Service, and the Soil Conservation Service.

This application was submitted to the State Engineer, who has been designated by the Governor of the State of Oregon to handle such matters. He approved the application and forwarded it to the State Conservationist.

LOCATION

This watershed lies in Columbia County along the Columbia River in the northwestern part of Oregon.

This watershed is oval in shape, oriented northwest-southeast on the major axis, and is located on the south side of the Columbia River in Ranges 2 and 3 West, Township 7 North, Willamette Meridian.

It is entirely in the Clatskanie Soil Conservation District. The western portion of the city of Rainier, Oregon is within its boundaries. The Rainier-Longview Toll Bridge approach bisects part of the east side.

OWNERSHIP

About ninety-five percent of the watershed, comprising 3,087 acres, is privately owned. The remainder, consisting of only about 160 acres, is owned by the State of Oregon and Columbia County. There are no Federally owned lands involved.

PHYSIOGRAPHY

The watershed comprises about 1,300 acres of overflow land at river level, and about 1,800 acres of steep, rocky land draining to the flat in several small drainages. Elevations vary from less than 25 feet above mean sea-level on the bottomlands to 800 feet at the highest point on the boundary ridge to the south. Channel gradients range from 15 to 25 percent; sideslope gradients are much greater, averaging more than 40 percent.

Drainage of the flood plain is slow and through Rinearson's Slough, water from which is pumped over a dike into the Columbia River at the northwest end of the area. The excess water is contributed by direct precipitation on the flood plain underseepage from the Columbia, and by seepage and streamflow from the steep south half of the watershed.

Drainage areas on the south side are steep and short, and flow is intermittent. Only the largest stream, at the southeast end near Rainier, carries a flow much of the year. The basalt rocks that underlie the area appear quite porous and probably permit some seepage to enter from outside the surface limits of the watershed.

GEOLOGY AND SOILS

The bottomlands are of relatively recent alluvium deposition, mainly from the Columbia River. Exposed on the cliff-like lower slopes are volcanics of early Tertiary age, while the upper slopes are underlain by newer volcanics from the mid-Tertiary.

Soils of the flood plain are derived from relatively recent alluvium deposited largely by the Columbia River. Sauvies is the predominant soil series with medium textured loams to fine textured clay loam surface soils. The subsoils range from moderate to slow in permeability and the underlying materials are of variable texture, depth and composition. Water tables are present

below drainage levels with the depth to the water table dependent on drainage level and elevation of soil bodies. Some small bodies of peat, muck and sands occur in the area.

Soils of the uplands are derived from volcanic rocks and aeolian deposits are of the Cascade and related soil series. They are fine textured loams with restricted drainage in the subsoils and underlying materials.

Upland soils appear stable against erosion. They afford good forest-growing conditions. Soil depths are shallow on the more exposed ridge noses to more than 4 feet in the coves and along the draws.

CLIMATE

Situated close to the Pacific Coast in northwest Oregon, the climate is mild and warm. Average annual rainfall ranges from about 44 inches on the bottomland to 50 inches along the upper ridge. Most of the precipitation comes in the period October to April as rain. Rainfall is largely of low intensity.

The frost-free growing season averages about 200 days, from April 15 to November 1. Average January temperature is about 38° F; average July temperature about 63° F. Maximum temperatures over 100° F and minimums well below 0° F have occurred but are quite unusual.

As the area is situated in the gap in the mountain chain cut by the gorge of the Columbia River, wind movement is fairly high. Fog is of fairly common occurrence, and humidities generally are high.

VEGETATIVE COVER

Where there is any soil on the steep slopes, brush or conifer forest has been established. The forest is of the coastal Douglas-fir type, with a strong mixture of cedar, hemlock and grand fir. Alder and Maple are common hardwood components. The flat bottomland has been all cleared for agriculture, as has most of the fringe of gently rolling land along the top of the watershed.

The growing site appears to be Class I or II; stumps of trees recently cut show widely spaced rings throughout. The present second-growth stand is 60 years old and is being cut in

one or two places. Original logging was done about 1880. The new stand is patchy, and contains a lot of alder. Ground cover is quite dense everywhere. The logging disturbance has not caused any soil erosion hazard; though the logging slash present may increase the fire danger considerably.

Presumably the area has good fire protection, though it is not known what organization is responsible for it. Access is easy at top and bottom, and the distance between is not great. Should a fire denude the upper area, the threat to the bottomland could be serious. Considerable erosion sediment would be carried down, and runoff rates would be increased to afflict an area already suffering from poor drainage. Aside from this possibility, there appears to be nothing in the present condition of the forest lands that would affect program development below.

The cropland is principally devoted to grassland pasture, hay and peppermint, with scattered areas producing row crops.

COOPERATION

During this field examination it was brought out that there are no Federally owned lands involved and only about 160 acres publicly owned. The Rainier Drainage District consists of 1,287 acres, most of which is cropland. It looks as though most of the damages are within this drainage district.

The people interviewed were well aware of their problems and were willing to cooperate in any way they could and stated that all the farmers in the area were of the same mind.

The Rainier Drainage District board members stated that they had set aside \$3,000. to assist, as part of their contribution, to solving their water problems.

The Soil Conservation District board has pledged to help in the preparation of conservation plans to speed the land treatment phase of the program.

The Corps of Army Engineers, who have made a Columbia River flood control study of this section, among other things, have constructed a river dike and built a pumping plants. They have expressed their desire to assist on any program which might be developed and come under their authority.



ECONOMY

In general, if a watershed program was inaugurated, the land use would not change materially. There could be 100 more acres of mint and 100 acres of row crops planted in the rotation. At present, out of the total acreage of 3,087 there are 1,242 acres cultivated, 1,800 acres forested and 45 acres in sloughs.

The cultivated acreage is broken down as follows: 500 acres of pasture, 300 acres of mint, 200 acres of annual hay, and 242 acres of other crops.

There are approximately 400 people living in the area on the 56 farms and many more small acreages. The farms vary in size according to enterprise; thirty-eight have over 10 acres and eighteen less than 10 acres.

Over ninety percent of the farms are owner operated.

At present, there are 450 acres which are sprinkler irrigated. The total acreage of 1,242 acres could be irrigated. About 160 acres of the higher, lighter soil areas have maximum drainage.

WATERSHED PROBLEMS

Water problems in the watershed are confined to the flat bottomland areas between the Columbia River and the steep escarpment-like upper watershed. The problems result from water from several sources:

- a) Runoff from precipitation that falls on the steep upper watershed and reaches the bottoms by way of numerous small rather indefinite drainage ways as well as considerable sheet flow or very shallow subsurface seepage.
- b) Direct precipitation on the bottom that has a tendency to collect in puddles, pools and shallow ponds because of the very flat gradients and natural surface irregularities.
- c) Seepage from several boil areas that appear to be fed at least in part from the main river.

- d) Water that is allowed to back into Rinearson Slough from the main Columbia through the control works near the mouth of the Slough.

Water from a 255 acre segment of the steep upper watershed enters the flat at the upper end of the bottomland area and must be carried for several miles on very flat grades through the bottomland to reach the discharge pumps.

Water from a 160 acre segment of steep watershed along one side of Rinearson Slough is picked up by a drainage ditch constructed along the toe of the slope and is discharged into the Slough just above the pumping plant. It is estimated these segments of the upper watershed discharge an average of about 2.5 acre feet per acre, into the bottomland area during the five months November through March. All of this water must eventually be discharged from the drainage area by the pumps along with the precipitation that falls directly on the bottom and the water that seeps in through the boils. The water that is allowed to flow into the Slough from the river is regulated so as to hold the water table at a desirable level and supply water for sprinkler irrigation.

The excess water resulting from precipitation comes during the rainy season (November through March). Seepage through the boils occurs most seriously during the period of high water in the Columbia, which during the 70-year period of record, has crested from April 4 to July 4 with the crest occurring between May 25 and June 25, 83 percent of the time. It is usually not necessary to let water back into the area until late summer, usually August and September.

There does not appear to be any way to avoid pumping the excess water resulting from precipitation falling directly on the area or from the seepage into the area during the high water stages of the Columbia. The cost of collecting runoff water from about 1,380 acres of the steeper part of the upper watershed which enters the area largely as sheet flow or shallow surface seepage in a distance of some three miles so that it could be discharged by gravity would probably exceed the cost of pumping. There does appear to be a probability that the runoff from the two segments of the watershed mentioned above totaling about 420 acres (23%) of the upper water could be collected and discharged into the river by gravity more economically than it is being pumped.

Due to high water on the cropland production is decreased, fertilizer applications, both commercial and barnyard, are de-

layed and on that which is applied there is a substantial loss of elements, livestock cannot be rotated properly to utilize the forage most efficiently, and the establishment of crops is curtailed.

SUMMARY

The main problem is how can the excess water which accumulates on the flood plain as floodwater and seepage be disposed of most economically and efficiently.

There exists two legal action groups, namely the Rainier Drainage District and the Clatskanie Soil Conservation District, that have the desire to alleviate the problems. Both of these are co-sponsors of the application for assistance and have the necessary powers to carry on any project which might be developed.

All the people that were interviewed expressed keen interest and willingness to assist in the preparation of a workable plan. The Rainier Drainage District board members stated that they had set aside \$3,000 as part of their contribution on the construction on works of improvement. They also stated that they were willing to contribute equipment, materials, and labor.

It was estimated that pumping costs could be reduced between \$500 - \$600 annually.

Crop production could be increased by a more reliable control of the water table.

Also the grazing of the lower areas could be managed more efficiently. This would also mean that livestock could be rotated according to plan for the most effective use of the forage.

The planting of crops and the application of fertilizer according to the recommended periods of establishment and application would be made possible.

It is estimated that after all have agreed to a program the works of improvement could be completed in about two years.



